On Individuals’ Resilience Strategies: Drawing and Applying Theories

Abstract
Individuals, both in frontline healthcare settings and more generally speaking, frequently deploy a range of resilient strategies and behaviours to maintain performance and mitigate a multitude of potential threats. Our work here describes how theories can be both derived-from and applied-to situated instances of resilience within frontline healthcare settings. We also recognise the value in considering how the concept transcends specific contexts, and the importance and potential significance of establishing such a theory both within, and transferrable across, a range of domains.

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Cognitive, Resilience, Strategies, Theory, Healthcare

ACM Classification Keywords
H1.2. User/Machine Systems: Human Factors. H.5.0. Information interfaces and presentation (e.g., HCI): General

Introduction
The application of existing theory to practice, in healthcare or elsewhere, creates challenges in identifying both the correct theory to apply and the specifics of how to adjust or tailor the theory in response to the immediate context. In contrast, when developing theory, the difficulty for the researcher is in
identifying the influences of the current context and to find a sufficient abstraction to make a genuine contribution to underlying theory. In this latter case, there are risks such as over-generalising, and including specific features of the current domain that are not true elsewhere, and also in privileging priorities that may mislead or obstruct the application in other contexts.

In our current research, we are seeking to build theories to help researchers understand individual actions taken to maximise the safety or performance of the socio-technical system in which they are working. This both draws from existing theories, and needs to provide interpretative power in the healthcare domain.

It has been demonstrated [1, 2] that workers and clinicians in a medical context take personal steps to optimise the care, safety and outcomes for their patients. We are examining these actions through the theoretical frame of individual cognitive resilience.

One challenge of our research is that it often contests the several established definitions of resilience in the healthcare domain. These are complementary to, yet distinct from, cognitive resilience: often being about systems, rather than individuals, and formal processes, in contrast to individual action.

Another problem is that the term 'cognitive resilience' is new. It is therefore somewhat loosely-defined, and its meaning is still being formed. Existing understandings of the term are frequently challenged and questioned by new research. Indeed, the term could itself be seen as misleading or inaccurate: both 'resilience' and 'cognitive' may be poor labels.

Therefore, the definition with which we are working, and the terminology with which we seek to work, both require substantial interpretation into the healthcare domain. This is a problem that we know is shared by other researchers using the same approach.

In the case of cognitive resilience, there are still shortcomings in the current development of theory. Even commonplace aspects of a theoretical landscape are lacking. For example, there is minimal work on separating and distinguishing different resilient behaviours for ensuring patient safety [3]. This shortcoming is not specific to the domain of health.

**Developing Theory in Cognitive Resilience**

In the context of our wider project, CHI+MED, a common goal shared by a number of researchers is to establish a set of strategies, or patterns, that depict the different kinds of actions and responses used in the management of threats, or, alternatively, that enhance an outcome in response to a foreseen possibility of a safe, yet sub-optimal, result. A set of such strategies would enable a closer, more systematic and principled analysis of individual observations of actions taken by medical staff in wards, or other environments.

In addition, a refined set of strategies would allow some degree of predictive power in a theoretical analysis of a specific device, environment or social context. We could, furthermore, better understand the content, form and properties of effective behaviours. It is therefore very desirable to reach the point where there is a well-evidenced set of strategies that has strong analytical, interpretative and predictive power.

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1 www.chi-med.ac.uk
Returning to the point of specific versus general contexts, it is likely that a set of strategies that is abstracted from a wider evidence base than medical contexts alone would be more powerful. Individual coping strategies may be borrowed from life experience or knowledge of another medical context not under current observation. To provide this wider, more reliable foundation, we gather evidence of resilience strategies both within and beyond the clinical domain.

Self-reported instances of individual resilience obtained through a recent diary study we have conducted serve to demonstrate the parallels between resilience on the medical frontline and in a broader range of contexts.

For example, one account detailed how an individual working in a hospital dispensary would, during periods of ‘downtime’, proactively and preemptively check patients’ needs in other areas of the facility. While not a formally recognised or required practice, this served a preparatory role and subsequently led to more efficient management of time and resources.

Immediate parallels can be drawn between the above example and an ‘everyday’ example of resilience recorded by another subject, who described, when preparing to travel to an unfamiliar location, using Google Streetview to perform a virtual tour of the route and destination to familiarise themselves with both.

In each of these cases, a candidate pattern in cognitive resilience, prospective checking, is employed to identify potential challenges and reduce the risks associated with unexpected conditions. In each case, effort is invested in conducting an anticipatory check with the intention of reducing future workload or vulnerability.

The appropriation of smartphone cameras as tools for rapidly capturing information quickly and accurately is another case where resilience strategies are seen within and outside the health domain.

Medical cases include multiple accounts of another hospital dispensary technician using this strategy to record and retrieve information. The data captured included drug and patient details, which needed to be moved from one location to another. The camera serves as a cheap, portable ‘data capture’ device, which preserved the original data in situ, but reduced both the error risk and time cost of transcription.

Likewise, we have several accounts of this same strategy being used outside of the medical context (e.g. individuals recording transport details, work schedules, or personal profiles in the same way). In both cases, again the mechanism (appropriation of a mobile phone) and the motivation (to eliminate the risk of forgetting, or recalling incorrect information) remain consistent across domains. Both are cases of a pattern of managing resource availability.

However, not all cases follow these relatively neat matches between domains. For example, the relatively impersonal and changing physical environment of many open clinical workspaces means that strategies that rely on those features are less common than in personal offices or at home. Our understanding of the few cases in wards, for example, benefits from having a wider view from which these can be more readily identified, and better understood and analysed.

One example of the impact of the environment is the manner in which cues are handled in the dispensary.
The use of physical post-it notes is described in situations where retrieval of particular information is known to be imminent (e.g. needing to call a nurse upon receiving a prescription, or a ‘to-do’ list that was in the process of being undertaken). However different cueing strategies are described in several cases where action was required after an extended period of time, or reoccurring on a long term basis. In these situations, staff instead wrote notes on the backs of their hands or emailed themselves reminders. These adaptations reflect the fact that unlike in a relatively stable home or personal office environment, physical cues such as post-it notes cannot live indefinitely on ones desk or monitor. Such cues are intrinsically much more frail in an unpredictable, busy and shared environment.

**Summary**

In this paper we have demonstrated a number of cases where similar behaviours can be observed within and beyond the context of health. This helps reaffirm and validate the theory that we are trying to both derive from and apply to the clinical context. At the same time, challenges to an emerging theory can be provided from both inside and beyond the medical domain. All this contributes to the interpretation of fieldwork within the clinical environment, and we hope would also assist researchers outside our specific context. The challenges to this process, that we have reported here, are shared by other members of the CHI+MED team, and are visible in the output of other researchers [4,5]

Fieldwork benefits from supporting theoretical tools that enable the researcher to interpret their observations both retrospectively and, ideally, prospectively. Our own research has for the recent past travelled across many domains, only a small fraction of which was health-related. However, the ultimate goal of our investigations is to develop theory to explain a key phenomenon in the realisation of the safe treatment of patients: individual ‘positive safety’ or ‘cognitive resilience’. Our ultimate aim is to empower fieldwork in the context of healthcare, but we argue that when developing theory, limiting the range of data from which one constructs an argument is unhelpful. We emphasise how there are strong benefits in contrasting both within and outside the context of medical work.

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**References**


